Effect of heifer frame score on growth, fertility, and economics

Accepted for Publication in the Asian-Australasian Journal of Animal Science

S. Senturklu[1,2], D.G. Landblom[1], G.A. Perry[3], T. Petry[4]

[1]Dickinson Research Extension Center, Dickinson, ND, 58601
[2]Department of Animal Science, University of Canakkale Onsekiz Mart, BMYO, Canakkale, Turkey 17200
[3]Department of Animal Sciences, South Dakota State University, Brookings, SD,
[4]Department of Agribusiness and Applied Economics, North Dakota State University, Fargo, ND

ABSTRACT

A non-traditional forage-based protocol was employed to evaluate replacement heifer growth, fertility, and economics between small-frame (**SF**: 3.50; n = 50) and large-frame (**LF:** 5.56; n = 50) heifers using three increasing gain growth phases. Preceding an 85 d growing-breeding period (Phase 3; P3) the heifers were managed as a common group for Phases 1 and 2 (P1 and P2). During P1, heifers grazed common fields of unharvested corn and corn residue (TDN 56%) with supplemental hay. For P2, heifers grazed early spring crested wheatgrass (CWG) pasture (TDN 62%) that was followed by the final P3 drylot growing and breeding period (TDN 68%). Small frame heifers were lighter at the end of P1 in May and at the start of P3 breeding in August (p = 0.0002). Percent of mature body weight (BW) at the end of P1 (209 d) was 48.7 and 46.8%, respectively, for the SF and LF heifers and the percent pubertal was lower for SF than for LF heifers (18.0 vs. 40.0%; p = 0.02). At breeding initiation (P3), the percentage of mature BW was 57.8 and 57.2 and the percentage pubertal was 90.0 and 96.0 (p = 0.07) for the SF and LF heifers, respectively; a 5-fold increase for SF heifers. Breeding cycle pregnancy on days 21, 42 and 63, and total percent pregnant did not differ (p > 0.10). In drylot, SF heifer DMI was 20.1% less (p = 0.001) and feed cost/d was 20.3% lower (p = 0.001), but feed cost/kg of gain did not differ between SF and LF heifers (p = 0.41). Economically important live animal measurements for muscling were measured in May and at the end of the study in October. SF heifers had greater *L. dorsi* muscle area per unit of body weight than LF heifers (p = 0.03). Small frame heifer value was lower at weaning (p = 0.005) and the non-pregnant ending heifer value was lower for SF heifers than for the LF heifers (p = 0.005). However, the total development cost was lower for SF heifers (p = 0.001) and the net cost per pregnant heifer, after accounting for the sale of non-pregnant heifers, was lower for SF heifers (p = 0.004). These data suggest that high breeding efficiency can be attained among March-April born SF and LF virgin heifers when transitioned to a more favorable May-June calving period through the strategic use of grazed and harvested forages resulting in a lower net cost per pregnant SF heifer.

Key Words: Beef heifer, Heifer production economics, Fertility, Frame score, Increasing energy management, Percent mature body weight